

## SOME NEMATODES FROM AUSTRALIAN ELASMOBRANCHS

By T. HARVEY JOHNSTON and PATRICIA M. MAWSON

University of Adelaide

[Read 12 August 1943]

The material on which the following report is based was, except in one instance, taken from elasmobranchs dissected by Zoology classes at the University. The work has been undertaken in connection with the Commonwealth Research Grant to the University. Types of new species have been deposited in the South Australian Museum. Professor Tiegs, University, Melbourne, kindly forwarded material from *Mustelus*.

The following is a list of the parasites examined, arranged under their hosts. HETERODONTUS PHILIPPI (Bloch and Schneider), Port Willunga: *Echinocephalus spinosissimus* (Linst.), *Paraleptus australis* n. sp., *Cucullanus heterodonti* n. sp., *Phlyctainophora* sp.

MUSTELUS ANTARCTICUS Gnthr., Victoria: *Paraleptus australis* n. sp.

UROLOPHUS TESTACEUS (Mull. and Henle), Sydney: *Paranisakis australis* n. sp., *Echinocephalus spinosissimus* (Linst.).

TRYGONORRHINA FASCIATA (Mull. and Henle), Port Willunga: *Proleptus trygonorrhinae* n. sp.

*Cucullanus heterodonti* n. sp.,  
(Fig. 1-2)

The males are 18 mm. long, the females 20-30 mm. The mouth opening is dorso-ventrally elongate, its edge slightly serrated. There are three pairs of cephalic papillae. The buccal mass is .3 mm. long by .33 mm. wide in the male, .4 mm. by .4 mm. in the female, with walls about 80  $\mu$  thick at the widest part. The oesophagus is 1.6-1.76 mm. long, widening towards its base. The nerve ring is about .52 mm. from the head; the excretory pore shortly behind this.

In the male the preanal sucker is 1.6 mm. in front of the anus, and the tail .4 mm. long terminating in a small spike. There are nine pairs of papillae, and one median preanal papilla, arranged as in fig. 2. The spicules are massive and equal, 3.2 mm. long; the gubernaculum is about .12 mm. long.

The female tail is .44 mm. in length. The vulva is situated 8 mm. from the posterior end in specimen 23 mm. long; the eggs are 54  $\mu$  by 80  $\mu$ .

*Proleptus trygonorrhinae* n. sp.  
(Fig. 3-4)

From the fiddler, *Trygonorrhina fasciata*, from Port Willunga. The males are up to 32 mm., the females to 35 mm., in length. The lips are small and surrounded by an inflated collar. Each bears externally two small papillae, and internally one median tooth. The oesophagus is divided into an anterior muscular and a wider posterior glandular part, .56 mm. and .4 mm. long, respectively, in the male. The nerve ring lies at the base of the anterior part, the small spine-like cervical papillae at the level of the anterior border of the nerve ring, and the excretory pore at the posterior border.

The male tail is .8 mm. long and is frequently rolled in a spiral. The caudal alae are unequal, but the four pairs of preanal and six pairs of postanal papillae are more or less symmetrically arranged. The longer spicule is needle-like, 1.2 mm. long; the shorter spatulate .24 mm. long.

In the female the rounded tail is .6 mm. long. The vulva is .1 mm. in front of the anus, the uteri uniting a short distance in front of this point. The eggs are 45  $\mu$  by 32  $\mu$ .

The species differs from *Proleptus robustus* Baylis 1933, and *P. obtusus* Linst., in the relative positions of the nerve ring, cervical papillae, excretory pore, and termination of the muscular part of oesophagus, as well as in the asymmetrical nature of the caudal alae.

***Paraleptus australis* n. sp.,**

(Fig. 6-8)

From *Heterodontus philippi* from Port Willunga, South Australia, and *Mustellus antarcticus* from Victoria.

The males are 25-30 mm. long, the females up to 45 mm. long, each carrying two large papillae externally, and internally one stout median tooth anteriorly and six pointed teeth, three on each side of the median tooth; dorsally and ventrally at the junction of the interlabia is another tooth.

The postlabial cuticle is voluminous, in most cases campanulate, in some collar-like.

The oesophagus is 4 mm. long in a young female, its anterior  $\cdot 8$  mm. slightly narrower than the succeeding part. The nerve ring is  $\cdot 5$  mm.; the excretory pore  $\cdot 7$  mm. from the head.

The spicules are very unequal, the longer 4.2 mm. in length, needle-like, the shorter  $\cdot 4$  mm., and spatulate. The caudal alae are but slightly developed, and all the caudal papillae are sessile; of these there are four pairs of preanal, three pairs immediately postanal, one pair half-way down the tail, and one pair, with double nerve endings, near the tip.

The posterior end of the female narrows suddenly after the anus, ending in a rounded tip. The vulva is 19 mm. from the posterior end in a 43 mm. long specimen, in the same specimen the vagina is 6 mm. long; there are two ovaries. The eggs are  $50 \mu$  by  $32 \mu$ .

The species differs from the only other of the genus, *P. scyllii* Wu, in the absence of caudal alae, in the number of teeth on the lips, and in the inequality of the spicules.

There seems to be some doubt as to the position of the genus *Paraleptus* Wu 1927, since it has been placed by Chitwood and Wehr (1933) as a synonym of *Abbreviata* Travassos 1920. We certainly consider that our species is distinct from *Abbreviata* on account of the position of the vulva.

***Echinocephalus spinosissimus* (Linst.)**

(Fig. 9)

A number of specimens of this species were collected from *Heterodontus philippi* at Port Willunga, and a few from *Urolophus testaceus* from New South Wales.

The species was present in every host specimen examined, and reached a much larger size than any previously recorded, namely, the males up to 66 mm., the females to 70 mm. The external surface of each lip bears two large papillae and a small median one, the internal surface is trilobed, the middle lobe slightly smaller, and each lobe carries two longitudinal ridges of thickened cuticle. No teeth are present. The head bulb carries about forty rows of small spines. The nerve ring is just posterior to the head bulb; the cervical papillae  $\cdot 2$  mm., and the excretory pore  $\cdot 23$  mm. behind the anterior end of the body (in a young female). The oesophagus is 4.4 mm. long in a young male, 7 mm. in a large female, and the cervical sacs are about half this length.

The spicules are equal, 1.2 mm. long in a 34 mm. long male, 2 mm. in a 66 mm. male. The tail,  $\cdot 7$  mm. long in a young male, tapers to a rounded tip, bearing slight caudal alae about  $\cdot 25$  mm. long on each side at the level of the anus. There

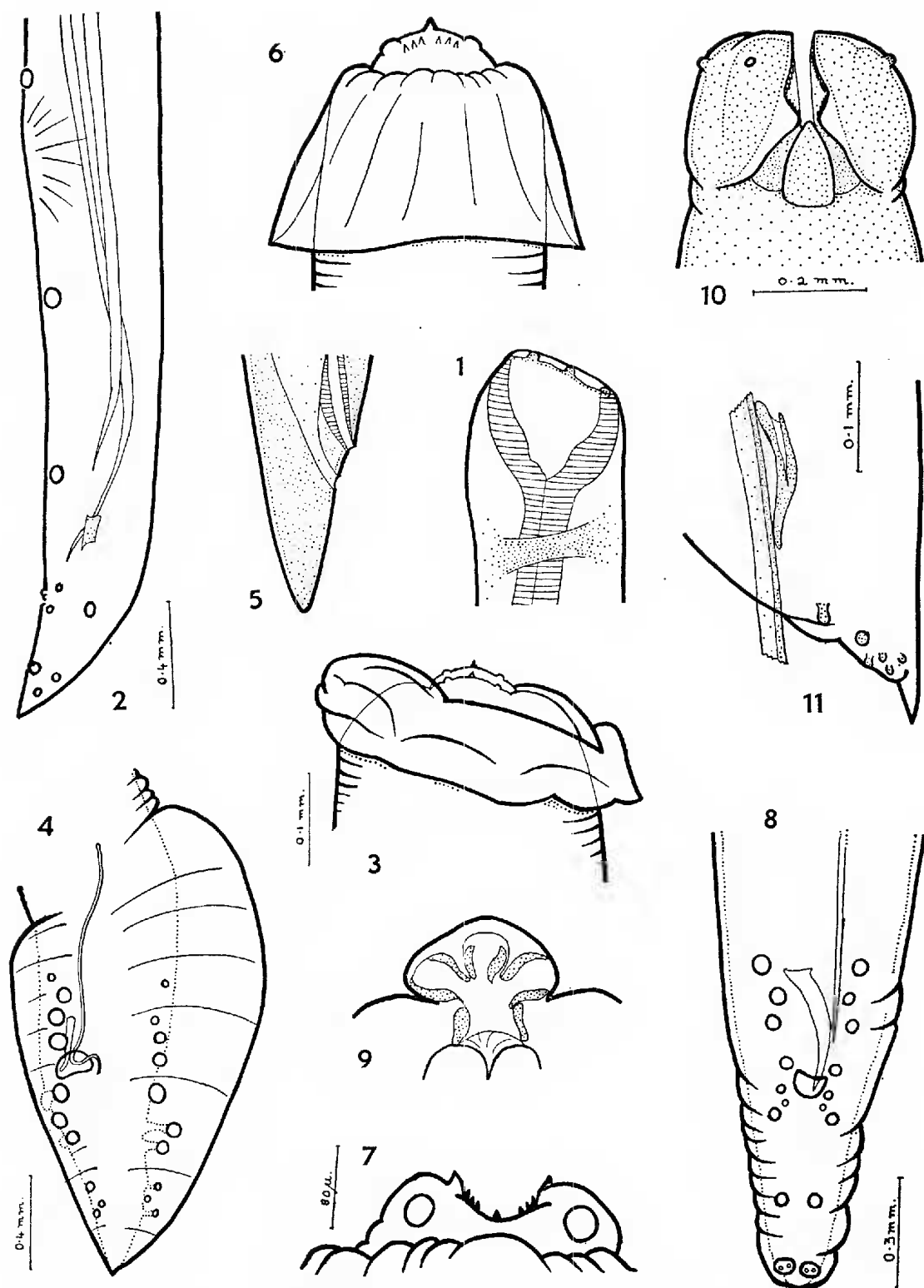


Fig. 1-2, *Cucullanus heterodonti*: 1, head; 2, male tail. Fig. 3-5, *Proleptus trygonorrhinae*: 3, head; 4, male tail; 5, female tail. Fig. 6-8, *Paraleptus australis*: 6, head, lateral view; 7, head, dorsal view; 8, male tail. Fig. 9, *Echinoccephalus spinosissimus*: inside of lip. Fig. 10, 11, *Paranisakis australis*: 10, head; 11, male tail. Fig. 1, 2, 7 and 8 to same scale; fig. 3 and 5 to same scale.

are one pair of pre-alar papillae, four pairs in the alae, and two pairs posterior to the alae. In the gravid female the body scarcely tapers until reaching the level of the vulva, when it tapers suddenly to the anus (which is situated almost immediately behind the vulva), and ends in a rounded-tipped cylindrical tail .8 mm. long. The eggs are thin-shelled,  $45\ \mu$  by  $27\ \mu$ .

In the presence of interlocking ridges on the median lobe of the lip, the greater size, the equal spicules and smaller number of caudal papillae in the male, our specimens differ from those described by Baylis and Lane 1920 (and re-described by Baylis 1939). The general characters of the head and oesophagus, however, indicate their identity with Linstow's species.

#### PHILYCTAINOPHORA sp.

From *Heterodontus philippi*, Port Willunga. In the course of dissection three cysts were taken from different specimens of *Heterodontus*; in each case they occurred in tissue in the pharyngeal region, either posteriorly near the Cuvierian duct or anteriorly near the hyoid arch. They were about 1.5 cm. long, and about 1 cm. or less in diameter. On careful opening no form could be followed; they appeared to be merely irregular thick-walled cysts containing a fluid, full of larval nematodes. The latter were on the average .35 mm. long,  $15\ \mu$  in diameter, the posterior end tapering to a fine point and the anterior truncated and apparently bearing a small tooth-like structure. No internal structures were observed. Apart from the fact that no structure suggestive of a female worm was observable in the cyst, the occurrence and the appearance of the larvae closely resemble those described as *P. lamnae* from a shark, *Lamna cornubica*, by Steiner (1921), and are placed in the same genus. We consider it likely that the latter should be assigned to the Philometridae.

#### *Paranisakis australis* n. sp.

(Fig. 10, 11)

From the stingray, *Urolophus testaceus*, from Sydney. The intestines of about twenty-five specimens dissected were singularly free from parasites, in marked contrast with the condition in *Heterodontus*. Only about ten nematodes were obtained, and of these four were specimens of an apparently new species of *Paranisakis*, of which the description is as follows.

Male 4.5-5 cm., female 5-6 cm. long. Head wider than long. Lips each bearing a row of fine denticles on inside of anterior border and along lateral flanges. Labial papillae very small. Interlabia about half length of lips. In female length of oesophagus 3 mm.; excluding the spherical ventriculus, .3 mm. in diameter. Nerve ring in female .8 mm. from head; excretory pore .88 mm.

Posterior end of male twisted in spiral; tail pointed; spicules 3.5 mm. and 2.9 mm.; gubernaculum .25 mm. long. About six pairs of large preanal papillae and six pairs postanal, as in fig. 11.

In female 5.5 mm. long, vulva with prominent lips, 2.2 mm. from head. Eggs  $36\ \mu$  by  $72\ \mu$ . Tail pointed.

The species agrees very closely with *P. pastinacae* (Rud. 1819) as described by Baylis 1936, but differs from it in the greater length of the spicules.

#### LITERATURE

- BAYLIS, H. A. 1936 Fauna of British India. Nematoda, 1  
 BAYLIS, H. A. 1939 Fauna of British India. Nematoda, 2  
 BAYLIS, H. A., and LANE, C. 1920 Proc. Zool. Soc., London, 345-???  
 STEINER, G. 1921 Centralbl. f. Bakt. Orig., 86, 591  
 WU, H. W. 1927 Contr. Biol. Lab. Sci. Soc., China, Nanking, 3, (2), 1-3